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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/592,936

09/15/2006

Koji Katano

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OLIFF & BERRIDGE, PLC

P.O. BOX 320850

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EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1726

NOTIFICATION DATE

DELIVERY MODE

12/27/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com

jarmstrong@oliff.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/592,936	<b>Applicant(s)</b> KATANO, KOJI	
	<b>Examiner</b> CYNTHIA LEE	<b>Art Unit</b> 1726	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

***Response to Amendment***

This Office Action is responsive to the amendment filed on 10/6/2010. Claim 8 has been canceled. Claim 11 has been added. Claims 1, 2, 4, 5, 7, 9-11 are pending. Applicant's arguments have been fully considered. Claims 1, 2, 4, 5, 7-11 are finally rejected for reasons stated herein below.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear as to which one of the plurality of the valves in claim 11 is referred to in "a spring member interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first portion and the second portion" in claim 1. It is unclear if "a plurality of hydrogen exhaust valve" of claim 11 includes "a hydrogen exhaust valve" of claim 1 or not.

It has been interpreted that one additional valve from claim 1 meets the limitation of claim 11.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 5, 7, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen (US 7235217) in view of Greiner (US 5728183) and Kiku (US 6908069).

Nguyen discloses a fuel cell system comprising:

a fuel cell body D;

a first portion A and a second portion B which cooperate with each other to jointly form a passage for hydrogen exhausted from the fuel cell body.

Regarding claim 5, the hydrogen processing unit includes a combustion unit.

Regarding claim 1, Nguyen discloses a first portion and a second portion which cooperate with each other to jointly form a passage for hydrogen exhausted from the fuel cell body, but does not disclose a hydrogen exhaust valve disposed in the passage between the first portion and the second portion, wherein the first portion and the second portion are directly fixed to each other and are both continuously supplied with heat from the fuel cell body following start up of the fuel cell body. Greiner teaches a first portion 60 and a second portion 25 which cooperate with each other to jointly form a passage for hydrogen exhausted from the fuel cell body, a hydrogen exhaust valve 43

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disposed in the passage between the first portion and the second portion, wherein the first portion 60 and the second portion 25 are directly fixed to each other.

Regarding claim 2, the first portion includes a gas-liquid separation unit 60 supplied with heat from inflowing exhaust gas from the fuel cell body.

Regarding claim 4, the second portion is a hydrogen processing unit 25 supplied with heat from inflowing exhaust gas from the fuel cell body.

Regarding claim 7, the first portion includes a cover 41 formed with an internal space that accommodates the hydrogen exhaust valve; and the second portion 21 closes the internal space of the cover within which the hydrogen exhaust valve is disposed. See fig. 1.

Regarding claim 9, the hydrogen exhaust valve 43 is fixed to the first portion 60 and the second portion 25. See fig. 1.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Nguyen's combustor, fuel reformer, and shift reactor for Greiner's compact shift reactor system for the benefit of compacting Nguyen's system.

It is noted that both portions naturally are supplied with heat continuously from the fuel cell body following start up of the fuel cell body because the temperature of the fuel cell is elevated during operation and thus, the hydrogen exhaust possesses heat.

Regarding claim 1, Nguyen modified by Greiner does not teach a spring member is interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first

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portion and the second portion. Regarding claim 10, Nguyen modified by Greiner does not teach seal mechanisms are respectively interposed between the hydrogen exhaust valve and each of the first portion and the second portion. Kiku teaches the following: Regarding claim 8, Kiku teaches a spring member 69 is interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first portion and the second portion. Regarding claim 10, Kiku teaches seal mechanisms 92p and 17 are respectively interposed between the hydrogen exhaust valve and each of the first portion and the second portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the valve of Kiku as the hydrogen exhaust valve of Nguyen modified by Greiner for the benefit of moving the hydrogen exhaust.

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greiner (US 5728183) in view of Kinoshita (US 5039579), Kiku (US 6908069) and Ohyauchi (US 4759997).

Greiner discloses a shift reactor comprising a first portion 60 and a second portion 25 which cooperate with each other to jointly,

a hydrogen exhaust valve 43 disposed in the passage between the first portion and the second portion, portion; and wherein the first portion 60 and the second portion 25 are directly fixed to each other.

Greiner does not disclose a fuel cell system comprising: a fuel cell body; a first portion and a second portion which form a passage for hydrogen exhausted from the fuel cell body; and wherein the first portion and the second portion are both continuously supplied with heat from the fuel cell body following start up of the fuel cell body. Greiner discloses that the shift reactor can be used for a fuel cell system (2:67). Kinoshita teaches a fuel cell system (fig. 3) comprising: a fuel cell body 1, a first portion and a shift reactor 25 feeding from hydrogen exhausted from the fuel cell body (6:35-45). It is noted that the shift reactor necessarily is continuously supplied with heat from the fuel cell body following start up of the fuel cell body because the shift reactor feed is the anode exhaust. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Greiner's shift reactor in the fuel cell of Kinoshita for the benefit of utilizing any unused hydrogen in the anode exhaust.

Greiner modified by Kinoshita discloses a valve, but does not disclose a spring member interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first portion and the second portion. Kiku teaches a spring member 69 is interposed between the hydrogen exhaust valve 4 and one of the first portion 1 and the second portion 92 to urge the hydrogen exhaust valve against the other one of the first portion and the second portion. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the valve of Kiku as the hydrogen exhaust valve of Greiner modified by Kinoshita for the benefit of moving the hydrogen exhaust.

Greiner modified by Kinoshita and Kiku teaches one hydrogen exhaust valve disposed in the passage, but does not disclose a plurality of the hydrogen exhaust valves disposed in the passage. Ohyauchi teaches a valve for the fuel 7 feeding the combustor 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add valves for the fuel 36 of Greiner's combustor for the benefit of controlling the amount of fuel and air fed into the combustor.

It is noted that claim 1 only requires one valve to be disposed between the first and second portions. It is noted that one additional valve from claim 1 meets the limitation of claim 11. It is noted that the valve of claim 11 does not require that it be disposed between the first and second portions. It only requires the valve to be in the passage of a hydrogen exhaust formed by the first portion and second portion.

### ***Response to Arguments***

Applicant's arguments filed 10/06/2010 have been fully considered but they are not persuasive.

*Applicant asserts that the spring member (69) of Kiku does not correspond to the claimed spring member because the spring member (69) of Kiku is unable to urge the valve (4) against the second portion (base body 1). The spring member (69) does not urge the cylindrical valve (4) against the base body (1) because the valve (4) is supported on one side by the direct acting shaft (67) that is fixed to the base body (1).*

In response, it is noted that the spring (69) is interposed between the valve (4) and the base body (1) (Applicant's 1<sup>st</sup> portion). It is noted that the base body (1) is



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interpreted as the 1<sup>st</sup> portion and the joint device (92) is interpreted as the 2<sup>nd</sup> portion.

When the spring (69) urges against the direction of P2, the spring (69) urges the valve against the joint device (92). See fig. 2 and [0056] of Kiku.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/  
Examiner, Art Unit 1795